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REVIEW ARTICLE

COST-EFFECTIVENESS OF PHYSICAL REHABILITATION AND CARE OF OLDER HOME-DWELLING PERSONS AFTER HIP FRACTURE: A SYSTEMATIC REVIEW AND NARRATIVE SYNTHESIS

Jonas Ammundsen IPSEN, PT, MScPT[1,2], Lars T. PEDERSEN, MScPH[1–3], Eva DARBORG, PhD[4], Inge H. BRUUN, PhD[1,2], Charlotte ABRAHAMSEN, PhD[2,5] and Bjarke VIBERG, PhD, MD[2,5]

From the [1]Department of Physical Therapy and Occupational Therapy, Lillebaelt Hospital, University Hospital of Southern Denmark, Kolding, [2]Department of Regional Health Research, University of Southern Denmark, Odense, [3]Department of Health Education, University College South Denmark, Esbjerg, [4]Danish Centre for Health Economics, Department of Public Health, University of Southern Denmark, Odense and [5]Department of Orthopaedic Surgery and Traumatology, Lillebaelt Hospital, University Hospital of Southern Denmark, Denmark, Kolding

Objective: **To provide a systematic review of the literature and knowledge base of cost per quality-adjusted life year of physical rehabilitation and care of older persons after hip fracture.**

Material and methods: **A research librarian assisted in searching 9 databases (14 May to 27 May 2021), with exclusion of studies on cognitively impaired or institutionalized individuals. A stepwise selection process was conducted by 2 authors, study quality was assessed using Drummond et al.'s checklist, and comparison between different countries was assessed using Welte et al.'s checklist.**

Results: **Three studies were included, which employed 3 different interventions initiated at 3 different postoperative time-points. One high-quality study demonstrated that comprehensive geriatric assessment was cost-effective compared with coordinated care. The other 2 studies did not find the interventions studied to be cost-effective, and both studies were deemed to be of moderate quality.**

Conclusion: **The body of evidence on the cost-effectiveness of physical rehabilitation and care after hip fracture is limited and heterogeneous, with only 1 high-quality study. Thus, stakeholders perform decision-making with a limited knowledge base of the cost-effectiveness of physical rehabilitation and care. We recommend researchers to assess cost-per-QALY.**

Key words: systematic review; quality-adjusted life year; quality of life; cost-effectiveness; rehabilitation; care; costs; hip fracture.

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Correspondence address: Jonas Ammundsen Ipsen, Department of Physical Therapy and Occupational Therapy, Lillebaelt Hospital, University Hospital of Southern Denmark, Denmark, Kolding. E-mail: Jonas.Ammundsen.Ipsen@rsyd.dk

LAY ABSTRACT

Hip fractures have severe consequences for older persons and, after surgery, patients need physical rehabilitation and care to recover. Physical rehabilitation and care vary greatly in terms of effectiveness and cost. It is not known what kind of physical rehabilitation and care contribute most to health relative to their costs. This systematic review provides the first comprehensive description of the cost-effectiveness of physical rehabilitation and care of older persons after hip fracture. Nine databases were searched, and 3 economic evaluation studies were identified. One economic study identified comprehensive geriatric care as cost-effective compared with usual coordinated care. The other two studies consisting of an intervention of additional 10 weeks of physical rehabilitation initiated 4 months after discharge and an intervention physical rehabilitation and nutrient management proved not cost-effective compared to usual rehabilitation and care. In conclusion, the number of studies published in this field is very limited and further research is necessary.

Hip fracture is the most common surgically treated trauma (1) and is associated with life-changing consequences for older home-dwelling persons, who experience reduced quality of life (QoL), physical function and mobility, as well as increased dependency on others (2, 3). After hip fracture, the most important goal for this patient group is to recover and regain independence (3). However, many patients do not regain their QoL or independence even a year after surgery (2, 4).

Physical rehabilitation and care are key interventions in facilitating recovery and improving QoL after hip fracture, and are routinely offered as individual or multifaceted interventions. The effectiveness of physical rehabilitation and care can vary greatly depending on the setting and content of the intervention (5–7).

A systematic review including 112 studies estimated the total world wide global cost per person in the first year after hip fracture as US$43,669. Physical rehabilitation and care was the second-largest driver

of cost in this estimate, accounting for US$12,020 per person (8) and with 1.6 million expected yearly hip fractures world wide (Johnell O, Kanis JA (2006) An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. Osteoporos Int 17(12):1726–1733) hip fractures has a significant impact on healthcare resources consumption.

Prioritizing healthcare services based on cost-effectiveness is critical to the efficient utilization of resources (9). Thus, the cost-effectiveness of physical rehabilitation and care interventions is important in determining whether one intervention generates better, equal or worse outcomes than another, based on their relative consumption of resources. In addition to determining the relative impact physical rehabilitation and care interventions have on persons, cost-effectiveness estimates must also take into account the setting and content of each intervention. Economic evaluations are demanded by stakeholders and have a great potential for expanding the knowledge base, but, to our knowledge, no systematic reviews of studies assessing the economic dimensions of physical rehabilitation and care after hip fracture have been published. Therefore, the aim of this systematic review was to provide an overview of the literature and knowledge base of cost per quality-adjusted life year (QALY) of physical rehabilitation and care after hip fracture for persons aged 65 years and older.

METHODS

Protocol and registration

The systematic review was reported according to the updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (10) and conducted in adherence with the article series "How to prepare a systematic review on health economic evaluations for informing evidence-based healthcare decisions: a five-step approach" (11–14). The protocol was registered with PROSPERO (ID: CRD42021281984) and is accessible at https://www.crd.york.ac.uk/PROSPERO/

Design

A systematic review and meta-analysis were originally planned; however, the number of studies found was limited and heterogeneous regarding both when the interventions were initiated after surgery and the content of physical rehabilitation and care. Therefore, a narrative analysis was conducted instead. It was thus planned to conduct an exhaustive, comprehensive search for quantitative studies and to discuss the results in depth in order to elucidate the effect of the interventions (15).

Eligibility criteria

The research question was developed based on the population, intervention and outcome (PIO). The study populations was compromised of older home-dwelling persons (65 years or older). Interventions comprised physical rehabilitation and care programmes targeting improvement in the person's physical functioning after hip fracture, which were mono- or multi-faceted, such as, but not limited to, physiotherapy, exercise and care interventions targeted improvement of the persons level of physical function after hip fracture (16, 17). The outcome measured was cost per quality-adjusted life year (QALY) in studies conducted in healthcare systems utilizing a single payer healthcare system comparable to those used in the Nordic countries (17, 18). Studies assessing interventions that targeted older persons with severe cognitive impairments, such as progressed dementia, or persons who were permanently institutionalized were excluded.

Information sources

Nine databases were selected based on their content descriptions at the University of Southern Denmark Library: MEDLINE, Embase, CINAHL, Cochrane Library, Scopus, the Health Technology Assessment (HTA) database of the Centre for Review and Dissemination, International HTA database, EconLit, and Academic Search Premier. All databases were deemed relevant by all authors and were searched from the date of inception.

Search strategy

Keywords were identified, assessed and arranged according to the PIO model. The search strategy was adapted to each database to account for differences in MeSH terms, indexation and matrix. All authors approved the keywords for each database. Grey literature in conference abstracts was searched. The search strategies are shown in Appendix S1.

A single author (JAI) performed all searches, during the period 14–27 May 2021.

Study selection

Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. Available at www.covidence.org, and a stepwise study selection process was conducted. Duplicates were removed, and 2 authors (JAI and LTPE) independently screened the remaining studies' titles and abstracts. Next, both authors (JAI and LTPE) independently performed full-text screenings for final inclusion. In both steps (screening of title and abstract and full text), disagreements were resolved by consensus, which occasionally involved all authors (JAI, LTPE, ED, IHB, CA and BV).

Data extraction

A single author (JAI) completed a data extraction form, based on the form developed by Wijnenn et al. (14), which was subsequently verified by all authors. The form comprised 13 items relating to general study characteristics and 18 items relating to study methods and outcomes. The completed data extraction forms are available in Appendix S2.

The following data were extracted: first author, year of publication, year of trial, funding source, competing interests, publication type, setting, person characteristics, intervention type, control intervention, study eligibility criteria, study perspective, type of economic evaluation, analytical method, time-frame, discount rates for costs and effects, inflation rate, type and category of costs, data source of resource use, methods for identifying resource use, assumptions for measurement of resources, costs reported or converted currency, data source of effects, methods of measuring effects, methods of valuation of effects, effects, incremental cost-effectiveness ratio (ICER), analyses of uncertainty (e.g. sensitivity analyses), outcome(s) of sensitivity analyses and authors' conclusions.

Disagreements were resolved through discussion and consensus between all authors.

Quality assessment

Quality assessment was performed using the commonly used checklist developed by Drummond et al., which was designed to appraise the quality of economic evaluations (9). The checklist was formatted as a table, with 1 axis showing each checklist criterion and the other axis presenting each economic evaluation, as suggested by Watts et al. (19). Each criterion was assessed as "Yes", "No" or "Can't tell". The criteria for "Yes" are described in Appendix S3. Two authors (JAI and LTPE) independently assessed the studies and subsequently compared their findings. Disagreements were resolved by discussion between the 2 authors, and unresolved disagreements were discussed with an experienced health economist (EUD).

Transferability of studies

Welte et al.'s decision chart was used to assess the transferability of the study findings (20). The decision chart is practical in use and consists of 3 general knockout criteria and 14 specific criteria (14, 21, 20). To meet the first and second general criteria, the physical rehabilitation and care intervention and the comparator must be compatible with the decision country. To meet the third general criterion, the study must be of acceptable methodological quality, which was appraised by applying Drummond et al.'s checklist (20). The specific criteria assess relevance on a 4-point scale, ranging from "very high" to "very low" (20). Correspondence must be deemed "very high" or "high" to assume an unbiased cost-effectiveness ratio (CER) (20). As Welte et al.'s (21) decision chart requires a comparison between 2 countries, we pragmatically chose one Nordic country (Denmark) as reference country to compare study countries against. The assessment of transferability was conducted by 1 author (JAI), who conferred with an experienced health economist (ED). Disagreements were resolved by discussion.

Data synthesis

A narrative synthesis summarizing and interpreting the findings of the individual studies was conducted. To compare costs from studies completed in different years and currencies, the reported currency was converted to euros using the mean conversion rate for the trial completion year, based on historical conversion rates (22). Furthermore, costs were forward discounted from the trial completion year to 2021 using the national discount rate from Denmark of 3.5% and the equation $P = Fn/1+R$ (P = present value; F=future value; n=number of years; R=interest rate) (9, 23) Table 3.

RESULTS

Study selection

The search located 1,493 studies, of which 502 duplicates were removed. After title and abstract screening, 953 studies were excluded, and, after full-text screening, 35 studies were excluded. Three studies remained and were included in this review. Two trial protocols currently recruiting were identified (24, 25), although as no results were available at the time of data extraction, these studies were not included. The study selection process and reasons for exclusion are shown in Fig. 1.

Study characteristics

The 3 included studies were trials that applied a healthcare perspective encompassing the use of physical rehabilitation and care services in the primary and secondary sectors (26–28). The studies displayed heterogeneity in how costs were collected, valued and in QoL preference weights used (26–28). Two studies were based on trials completed in 2010 (26, 28) and 1 study was based on a trial completed in 2014 (27). One study was conducted in Australia (26) while 2 were conducted in Norway (27, 28). The interventions consisted of different types of physical rehabilitation and care, and were initiated at different postoperative timepoints. The study characteristics are shown in Table I.

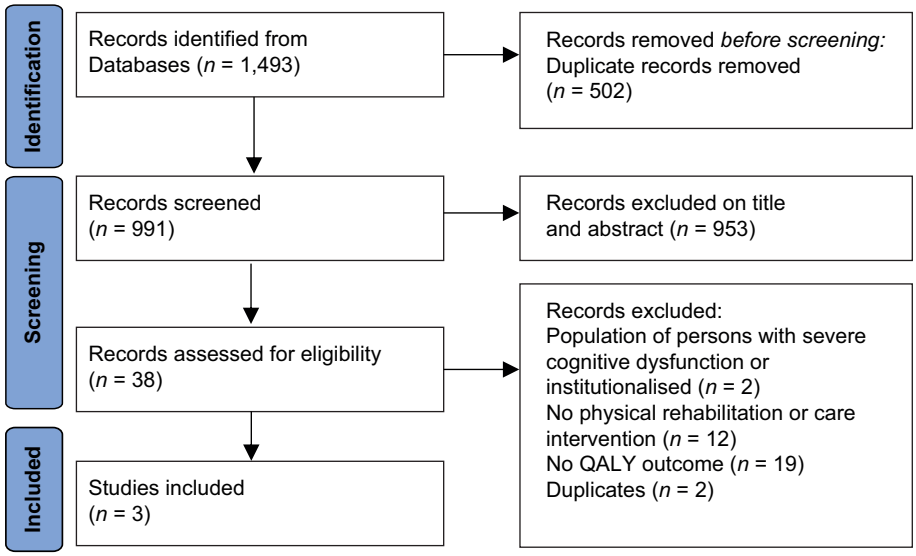

Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart. QALY: quality-adjusted life years.

Table I. Study characteristics

Study id	Study	Study completion year	Number of persons control/ intervention	Perspective	Effect measure	Preference weights	Country	Intervention summary
1	Milte, R. 2016	2010	99/76	Healthcare sector perspective	A-QOL	Australian general population weights	Australia	Exercise was performed 3 times per week and progressed every 14 days by trial physiotherapists. Dietary strategies included dietary counselling focusing on timing, size, and frequency of meals, recommendations of nutrient-rich foods and recipes, referral to community meal programmes, and provision of commercial oral nutritional supplements or commercial protein powders as deemed appropriate. The intervention lasted 10 weeks with weekly visits. The control group received usual rehabilitation.
2	Taraldsen, R. 2019	2014	73/70	Healthcare sector perspective	EQ-5D-3L	English tariffs	Norway	Persons received a home-based programme, starting 4 months post-surgery. The programme consisted of 2 exercise sessions per week and lasted 10 weeks. Each session had a duration of approximately 45 min and was supervised by physiotherapists. The control group received usual rehabilitation.
3	Prestmo, A. 2015	2010	199/198	Healthcare sector perspective	EQ-5D-3L	English tariffs	Norway	Intervention persons received comprehensive geriatric care in a geriatric ward with an emphasis on comprehensive medical assessment and treatment, initiation of rehabilitation through mobilization. Number of staff per bed was higher in the geriatric ward. Control received usual rehabilitation at the orthopaedic ward.

A-QOL: Assessment of Quality of Life (A-QOL) instrument; EQ-5D-3L: Euroqol five dimension three level (EQ-5D-3L) questinaire.

Milte et al. (26) assessed a 10-week individualized nutrition and exercise intervention initiated shortly after discharge after hip surgery. QoL outcomes were measured using the 5-dimension assessment of quality of life instrument (AQoL-4D) with preference weights for the general Australian population. Data collection was carried out weekly by trial staff. The questionnaire was used in combination with registry data encompassing the use of medical and pharmaceutical benefit schemes. The study's time-frame was 6 months. Costs were adjusted to a 2010 consumer price index (trial year) and valued to accepted unit costs from the Australian National Hospital Cost Data Collection and cost of visits from allied healt professionals were taken from rebates specified by Department of Veterans Affairs.

Taraldsen et al. (27) assessed the outcomes of a 10-week, late-phase exercise programme initiated 4 months after discharge after hip surgery. QoL outcomes were measured using the EQ-5D-3L with English preference weights. Administrative registers, municipal person records and the Norwegian Directorate of Health were used to collect data on the use of healthcare services. Valuation of costs was based on fee-for-service information in Norwegian kroner

(NOK) and reported in 2012 euros using the mean exchange rate from 2012. The study's time-frame was 8 months.

Prestmo et al. (28) assessed the outcomes of a comprehensive geriatric assessment (CGA) at a geriatric hospital ward compared with usual care at an orthopaedic ward. QoL was measured using the EQ-5D-3L with English preference weights. Data on the use of healthcare services was obtained through administrative systems, municipal patient records, the Norwegian Patient Register and the Norwegian Health Economics Administration. Costs were valued using published costs or local experts and municipal websites in NOK and presented in 2010 euros based on the mean exchange rate from 2010. The time-frame of the study was 12 months.

Quality assessment

The study by Prestmo et al. (28) was determined to be of high quality, while the studies by Taraldsen et al. (27) and Milte et al. (26) were of moderate quality.

None of the studies achieved "Yes" ratings for all criteria, as they did not account for different time-frames or include all costs relevant to the healthcare perspective. Milte et al. (26) and Prestmo et al. (28) disclosed differential timing, though a comparison was deemed unfeasible due to their respective time-frames of 6 and 12 months. Taraldsen et al. (27) did not disclose their reasons for not adjusting for differential timing. The studies were heterogeneous in the costs included in the healthcare sector perspective, as, for instance, only 1 study, by Milte et al. (26), included use of medication in calculation of costs.

The studies' included costs are detailed in Appendix S4.

Milte et al.'s study (26) was assigned ratings of "No" for 3 additional criteria. First, the study had an insufficient description of the comparator. Without knowledge of the contents and settings of usual physical rehabilitation and care in Australia, it was not possible to assess the comparative intervention. The second "No" was assigned for reporting an ICER estimate based on a minor statically insignificant difference in effect, which was inappropriate. The third "No" was due to the discussion, which did not reflect these concerns regarding the ICER estimate.

Taraldsen et al.'s study (27) was assigned "No" ratings on 2 additional criteria. First, the ICER was estimated and reported based on a small statistically insignificant difference in effect. Secondly, there was no reporting of an ICER plane or cost-acceptability curve, and the cause for not reporting an ICER plane was undisclosed, thus making the interpretation less transparent to the reader.

Table II. Quality assessment of studies using Drummonds Checklist

Economic evaluation	Research question well defined?	Comprehensive description of alternatives?	Effectiveness of programme established?	Important and relevant costs and consequences for each alternative identified?	Costs and consequences measured accurately and appropriately?	Costs and consequences valued credibly?	Costs and consequences adjusted for differential timing?	Incremental analysis of costs and consequences performed?	Allowance made for uncertainty in estimates?	Presentation and discussion of study results include all issues of concern to users?
Milte, R 2016	Yes	No	Yes	No	Yes	Yes	No	No	No	No
Taraldsen, K. 2019	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No
Prestmo, A. 2015	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes

Table III. Summary of findings regarding the cost-effectiveness of rehabilitation of older home-dwelling persons after hip fracture

Study id	Economic evaluation	Intervention effect	Control effect	Difference in QALY gain (95% CI)	Intervention costs, €	Control costs, €	Cost difference (95% CI)	Cost per QALY (€/QALY)
1	Milte, R. 2016	0.155	0.139	0.02 (–0.027, 0.059)	21.551,86	21.268,93	€ 206,39 (–2,928.98, 3,468.72)	€ 13.471,14
2	Taraldsen, K. 2019	0.73	0.73	0	26.219	25.976	€ 242.9 (– 6.82, 6.75)	–
3	Prestmo, A. 2015	0.52	0.45	0.09 (0.02, 0.16)	37.213,52	40.743,44	€ –3.528,00 (–8,808.14; 1,989.34)	€ –49.145,53

QALY: quality-adjusted life year; 95% CI: 95% confidence interval.

Prestmo et al.'s study (28) received "Yes" ratings for the remaining criteria.

The quality assessment of the 3 studies is shown in Table II.

Transferability

Milte et al. (26) fulfilled the first and third general knockout criteria. However, the second criterion was not fulfilled, as the description of usual physical rehabilitation and care was too general to adequately assess the content and setting of the comparator. Correspondence in practice variation was deemed "low", as the mean length of stay of 16 days was considerably longer than usual practice in Nordic countries (26, 29). In addition, correspondence was "low" in 3 specific criteria. First, the inclusion of weekly social visits with the control group and the longer length of stay did not correspond well to procedures in Nordic countries. Secondly, the lack of a description of usual physical rehabilitation and care made direct comparisons between countries impossible. Thirdly, it is unknown how Australian QoL preferences compare with a Nordic population. As Danish and English QoL preferences do not equate, we cannot assume high correspondence between Australian and Nordic populations (30). Thus, the ICER estimate was considered biased.

Taraldsen et al. (27) met all 3 knockout criteria, and the correspondence between Norway and Nordic countries was deemed "high" (27). The healthcare perspective was narrower than recommended, although it is the most commonly used perspective in western countries (31). The ICER estimate was thus rated as unbiased.

Prestmo et al. (28) fulfilled the 3 general knockout criteria, and the correspondence between Norway and Nordic countries was deemed high. As the healthcare sector perspective was narrow, but the most commonly used, the ICER estimate was rated as unbiased (31).

The completed transferability decision charts are shown in Appendix S5.

Findings

Milte et al. (26) detected a difference in QALY gain of 0.02 (95% confidence interval (95% CI) –0.027, 0.059; intervention group 0.155 vs control group 0.139) (26), but the difference was not statistically significant. The mean total cost difference was €206.39 (95% CI –2,928.98, 3,468.72; intervention group €21,551.86 vs control group €21,268.93). Assuming the difference between groups was a true difference, the incremental cost per QALY was estimated as €13,471.14.

Taraldsen et al. (27) reported no difference in QALY gain between the groups (intervention group median 0.73 vs control group median 0.73) (27). The mean total cost difference was €51, 3 (95% CI –6.82, 6.75; intervention group €26,219 vs control group €25,976).

Prestmo et al. (28) demonstrated a statistically significant difference in QALY gain of 0.09 (95% CI 0.02, 0.16; intervention group mean 0.52 vs control group mean 0.45) (28). The total cost difference was –€3,528.00 (95% CI 2928.98, 3468.72; intervention group €37,213.52 vs control group €40,743.44). The incremental cost per QALY was –€49,145.53.

A summary of the studies' findings is shown in Table III.

DISCUSSION

This systematic review presents the findings of 3 primary studies assessing different physical rehabilitation and care interventions compared with usual physical rehabilitation and care after hip fracture (26–28). Two of the studies showed that the interventions were not cost-effective, while the third study found the intervention to be cost-effective. Prior to this study PROSPERO (ID: CRD42021281984), the protocol was registered in Open Science Framework and remained unchanged during the review, except for the omission of a meta-analysis due to heterogeneity between studies.

The narrative synthesis revealed pronounced heterogeneity between studies, which is similar to a previous systematic review assessing the global cost of fragility hip fractures.which reported significant heterogeneity between studies affecting the credibility and accuracy of the results (31).

Prestmo et al. (28) demonstrated that CGA, including physical rehabilitation and care at a geriatric ward was more effective and less costly compared with usual care at an orthopaedic ward. In contrast, a Swedish study by Lofgren et al. (32), comparing coordinated rehabilitation and care at a geriatric ward with usual rehabilitation and care at an orthopaedic ward for hip fracture patients detected no difference between programmes in QoL. The difference between these 2 studies in the effect on

QoL might be explained by differences in interventions (28, 32). CGA appears to be more comprehensive than coordinated rehabilitation; however, the descriptions were vague (28, 33). An additional explanation might be found in population differences, as Lofgren et al. (32) included persons living in nursing homes. Milte et al. (26) and Taraldsen et al. (27) did not find 2 different physical rehabilitation and care interventions to be cost-effective compared with usual physical rehabilitation and care in the primary sector. This may indicate that the content and scope of physical rehabilitation and care are important factors in improving persons' QoL.

None of the included studies found their interventions to be more resource-demanding than usual physical rehabilitation and care (26–28). In 2 of the studies, this was probably due to fewer persons in the intervention group being admitted to nursing homes (27, 28). If nursing home admissions remain lower in the long term it might have implications for the cost-effectiveness ratio. This is potentially supported by an Australian study by Cameron et al. (34), which identified accelerated rehabilitation, including components of CGA, early mobilization and discharge programmes as less costly and as effective at recovering patients' level of function as conventional rehabilitation. However as Prestmo et al. (28) followed persons for only 12 months and Taraldsen et al. for 8 months, it was not impossible to assess the long-term implications of the interventions (26–28). Thus, this should be assessed in future studies with a longer follow-up period, which, if feasible, are powered to the high mortality and drop-out rate of frail older persons.

Two of the included studies, by Taraldsen et al. (27) and Prestmo et al. (28), were conducted in a healthcare system organized in a primary sector (municipalities) and a secondary sector (hospital). In the study by Taraldsen et al. (27) the intervention imposed an increased and decreased use of municipal rehabilitation. In the study by Prestmo et al. (28) the intervention increased hospital cost and decreased the use of municipal care. Thus, in both studies the stakeholders paying the intervention were not the ones receiving the benefits. Based on the limited number of studies available, it was not possible to assess the significance of this potential barrier for implementation of new and more effective physical rehabilitation and care interventions.

Applying a narrow healthcare sector perspective in cost-effectiveness studies increases the risk of underestimating true resource use (9, 35). The 3 studies in this review included different costs in their assessments using the healthcare sector perspective (26–28). For example, Milte et al. (26) included the cost of social visits to the control group, while Taraldsen et al. (27) included the cost of psychiatric care in hospital, and Prestmo et al. (28) included the cost of hospital stays post-discharge. This indicates an overly narrow perspective of the minimal requirements of the healthcare sector. In contrast, the societal perspective is more feasible in older persons after hip fracture, as it includes the costs of informal care. Informal caregivers have been estimated to deliver a mean of 39.5 h of care per week in the first 6 months after hip fracture, and 36% of informal caregivers report a high perceived burden of care (36, 37).

Strengths and limitations

A strength of this systematic review was the very broad search performed in cooperation with a research librarian (13). To further exhaust the search, reference lists and grey literature were searched, though no additional relevant studies were identified. An additional strength was the study selection process, which was carried out independently by 2 researchers. Furthermore, study quality was assessed using a well-established checklist developed by Drummonds et al. (9), and 2 reviewers performed the assessment independently (19, 38).

Healthcare reimbursement schemes and the content of usual physical rehabilitation and care can bias or prevent credible comparisons of outcomes and costs between countries. Thus, the current review systematically assessed the transferability of study findings to a Nordic context using the Welte decision chart (20). This was carried out by a single author, and to reduce the risk of biased assessment, an experienced health economist advised in this process. A second assessor would have reduced the risk of assessor influence; however, it is not considered likely that a second accessor would have altered the assessment of transferability.

CONCLUSION

The evidence base of the cost-effectiveness of various physical rehabilitation and care interventions after hip fracture is limited and heterogeneous. Only 1 of 3 interventions was shown to be cost-effective. The studies used the same healthcare sector perspective, but did not include all relevant costs, and the interventions differed in content and were initiated at different postoperative time-points. This prevented pooled effect size estimates and clear recommendations for physical rehabilitation and care of older home-dwelling persons after hip fracture. Based on the findings of this systematic review, future economic evaluations should employ broader perspectives and a plan for longer follow-up to capture the long-term implications of physical rehabilitation and care. The inclusion of only 3 economic evaluations underscores the need for more economic research studies to sup-

port healthcare decision-making and prioritization, and highlights a gap in the current knowledge base.

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